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(54) **Apparatus and method for clamping a web.**

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Description

The present invention relates to an apparatus for clamping a web and wrapping a load with the web according to the preamble of claim 1 and method for clamping a web and wrapping a load with a web according to the preamble of claim 28. Such an apparatus and a method are shown in US-A-45 45 182. The apparatus there comprises means for dispensing the web, means for rotating the load relative to the dispenser means to wrap the web on the load, and a clamp having means for clamping the web including a first longitudinally extending clamp means. The clamp means has first contact means for contacting the web. Furthermore, the means for clamping the web includes further a second longitudinally extending clamp means having a second contact means. Both clamping means are adapted to clamp said web between the first and second contact means.

A wide variety of clamping devices have been developed to accommodate the specialized needs of operations in diverse fields. Such developments have specifically occurred in the field of stretch wrapping, which involves the process of wrapping a load with a web of stretchable material. As stretch wrapping technology developed and became increasingly automated, clamping arrangements were developed which accommodated and complemented the other features of the operation. Examples of such clamping arrangements for stretch wrapping machines are shown in U.S. Patent Nos. 4,232,501 and 4,300,326 to Stackhouse and 4,317,322 to Lancaster et al., all of which are assigned to Lantech, Inc., and incorporated herein by reference.

Although successful, these arrangements have limitations in positioning and control during the operation of the stretch wrapping equipment.

Accordingly, it is the object of the present invention to provide a clamping arrangement which has less restrictive limitations in positioning and control during stretch wrapping operations than previously known arrangements.

This object is solved by an apparatus according to claim 1 and a method according to claim 26.

In the apparatus there is provided a clamp comprising a first longitudinally extending clamp means for engaging a work piece; the second longitudinally extending clamp means extendable in a direction parallel to the longitudinal direction of the first clamps means for clamping a workpiece between the second clamp means and the first clamp means as the second clamp means is longitudinally extended in a direction parallel to the longitudinal direction of the first clamp means. It is preferable that the second clamp means is extendable relative to the first clamp means for clamping the workpiece between the second clamp means and the first clamp means. It is further preferable that the clamp includes a base means for supporting and cantilevering the first and second clamp means, the first clamp means extendable relative to the base and the second clamp means for receiving a workpiece.

It is also preferable that the first clamp means includes first contact means for contacting the workpiece, and the second clamp means includes second contact means opposed to the first contact means for contacting the workpiece, the second contact means being supported by the remaining portion of the second clamp means and movable relative to the remaining portion of the second clamp means while being fixed relative to the first contact means for clamping the workpiece between the first contact means and the second contact means. It is further preferable that the first and second contact means sequentially and continuously clamp the workpiece across a section of the workpiece. It is also preferable that at least one of the first and second contact means is a belt.

It is also preferable that the clamp includes cutting means mounted near the cantilevered end of the second clamp means for cutting the workpiece while clamping the workpiece. It is additionally preferable that the clamp includes wipe down means mounted proximate to the cantilevered end of the second clamp means for wiping down the workpiece while clamping the workpiece.

In further accordance with the purposes of the invention, there is provided apparatus for clamping a web and wrapping a load with a web comprising: means for dispensing the web; means for rotating the load relative to the dispenser means to wrap the web on the load; and means for clamping the web including a first longitudinally extending clamp means for engaging the web, a second longitudinally extending clamp means extendable in a direction generally parallel to the longitudinal direction of the first clamp means for clamping the web between the second clamp means and the first clamp means as the second clamp means is longitudinally extended in a direction parallel to the longitudinal direction of the first clamp means.

Also in accordance with the purposes of the invention there is provided a method of wrapping a load with a web comprising: positioning a load in a position to be wrapped; rotating the load relative to a web dispenser to wrap the web on the load; extending a first longitudinally extending clamp element along its longitudinal direction into the wrapping path of the web; passing the web over the first clamp element; extending a second longitudinally extending clamp element along its longitudinal direction in a direction parallel to the first clamp element to clamp the web between the first and second clamp elements as the second clamp ele-

ment is longitudinally extended in a direction parallel to the longitudinal direction of the first clamp element.

With the present invention there is provided a clamping arrangement which easily orients itself to the work piece which is clamped. The clamping arrangement minimizes lateral movement of the clamp during operation and the space required for such movement. The clamping arrangement furthermore, can be easily positioned and removed from a work location without interferring with the other operations of the apparatus. The clamping arrangement also smoothly secures a work piece without causing damage.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings, which are incorporated in and constitute part of the specification, illustrate a presently preferred embodiment of the invention and, together with the general description given above and the detailed description of the preferred embodiment given below, serve to explain the principles of the invention.

Fig. 1 is a perspective view of a clamp incorporating the teachings of the present invention;

Fig. 2 is a front end perspective view of the clamp illustrated in Fig. 1 without a wipedown brush;

Fig. 3 is a front end perspective view of a second embodiment of a clamp according to the teachings of the present invention;

Figs. 4A-4E are schematic left side views of the embodiment shown in Figs. 1 and 2 executing an embodiment of a method incorporating the teachings of the present invention;

Figs. 5A-5C are schematic left side views of the embodiment shown in Fig. 3 executing another embodiment of a method incorporating the teachings of the present invention;

Fig. 6 is a right side elevation view of a portion of the embodiment illustrated in Fig. 1 in a slightly different position;

Fig. 7 is a front end section view of an apparatus for clamping a web and wrapping a load with the web, incorporating the teachings of the present inventicn; and

Fig. 8 is a perspective view of an alternative embodiment to the arrangement shown in Fig. 7.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Reference will now be made in detail to the present preferred embodiment of the invention as illustrated in the accompanying drawings.

In accordance with the present invention there is provided a clamp comprising: a first longitudinally extending clamp means for engaging a workpiece; a second longitudinally extending clamp means extendable parallel to the longitudinal direction of the first clamp means for clamping a workpiece between the second clamp means and the first clamp means as the second clamp means is longitudinally extended in a direction parallel to the longitudinal direction of the first clamp means. It is preferable that the second clamp means is extendable relative to the first clamp means and that a base means is included for supporting and cantilevering the first and second clamp means.

As shown and embodied in Fig. 1, there is provided a clamp 30. The first longitudinally extending clamp means is a first rigid longitudinally extending clamp bar 32 which is a slender member. The second longitudinally extending clamp means includes a second longitudinally extending clamp bar 34 which is a slender member that extends generally parallel to the longitudinal extent of the first clamp bar 32. The base means includes a first rodless cylinder 36 and a second rodless cylinder 38. Both rodless cylinders 36 and 38 are connected to a rigid frame 40 which supports and fixes both rodless cylinders 36 and 38 relative to the ground during operation.

Rodless cylinders, in and of themselves, are known, commercially available devices which may be obtained from manufacturers such as Tol-O-Matic or Origa. Although rodless cylinders are currently preferable, the use of traditional piston and cylinder arrangements, as well as other motive systems, are within the scope of the invention. Rodless cylinders 36 and 38 include respective outer housings 42 and 44 which are secured to frame 40, pistons 46 and 48 which are selectively powered and movably positioned along the longitudinal length of outer housings 42 and 44.

Piston 46 of first rodless cylinder 36 is attached to first clamp bar 32 through an intermediate support 58. Likewise, piston 48 of second rodless cylinder 38 is connected to second clamp bar 34 through an intermediate support 60. In such a manner, the first rodless cylinder 36 is used to support, as well as longitudinally extend and retract first clamp bar 32. Likewise, second rodless cylinder 38 is used to support, as well as longitudinally extend and retract second clamp bar 34 in a direction parallel to the longitudinal extent of the first clamp bar 32. Clamp bars 32 and 34 are cantilevered by rodless cylinders 36 and 38 because they are only attached to rodless cylinders 36 and 38 at one of the respective ends. Clamp bars 32 and 34 are independently extendable relative to each other and are also simultaneously extendable relative to rodless cylinders 36 and 38.

According to the present invention, the first clamp means includes first contact means for con-

tacting the workpiece, and the second clamp means includes second contact means opposed to the first contact means for contacting the workpiece, the second contact means being supported by the remaining portion of the second clamp means and movable relative to the remaining portion to the second clamp means while being fixed relative to the first contact means for clamping the workpiece between the first contact means and the second contact means.

As shown and embodied in Figs. 1 and 2, and 4 A-E the first contact means is a contact strip 62 of resilient material. The remaining portion of the first clamp means is the remaining portion 64 of the first clamp bar 32, namely, a metal bar with a longitudinally running groove. Contact strip 62 is affixed in the longitudinally running groove of remaining portion 64 of first clamp bar 32 Therefore, it is seen that the remaining portion of the first clamp means is the portion of the first clamp means other than the first contact means.

As shown and alternatively embodied in Figs. 3 and 5 A-C, the first contact means is a belt 66a which passes around pulleys 68a at the ends of first clamp bar 32a. The remaining portion of the first clamp means is the remaining portion 64a of the first clamp bar 32a, namely, a metal bar with a longitudinally running slot. Pulleys 68a and belt 66a are positioned in the longitudinally running slot of remaining portion 64a of first clamp bar 32a so that belt 66a is longitudinally movable relative to the remaining portion 64a of first clamp bar 32a. Therefore, it is seen that the remaining portion of the first clamp means is the portion of the first clamp means other than the first contact means.

In the embodiment of Figs. 1, 2, and 4 A-E, the second contact means includes an endless belt 70 which passes around pulleys 72. The remaining portion of the second clamp means is the remaining portion 74 of second clamp bar 34, namely, a metal bar with a longitudinally running slot. Pulleys 72 and belt 70 are positioned in and supported by the remaining portion 74a of second clamp bar 34a. Therefore, it is seen that the remaining portion of second clamp bar means is the portion of the second clamp means other than the second contact means. Belt 70 is movable along the longitudinal length of second clamp bar 34 relative to the remaining portion 74 of the second clamp bar 34 while being fixed relative to contact strip 62.

In the embodiment of Figs. 3 and 5 A-C, the second contact means includes an endless belt 70a which passes around pulleys 72a. The remaining portion of the second clamp means is the remaining portion 74a of the second clamp bar 34a, namely, a metal bar with a longitudinally running slot. Pulleys 72a and belt 70a are positioned in and supported by the remaining portion 74a of second clamp bar 34a. Therefore, it is seen that the remaining portion of second clamp means is the portion of the second clamp means other than the second contact means. Belt 70a is movable along the longitudinal length of second clamp bar 34a relative to the remaining portion 74a of the second clamp bar 34a while being fixed relative to belt 66a.

In the embodiment of Figs. 1, 2 and 4 A-E, and shown in Fig. 4 A-E, a portion 75 of belt 70 is attached to the first clamp bar 32 to allow the opposing portion of belt 70 to be fixed relative to contact strip 62 at all times. In this arrangement, the opposing portion of belt 70 will move relative to remaining portion 74 of second clamp bar 34 when there is relative movement between the remaining portions 64 and 74 of clamp bars 32 and 34.

In the embodiment shown in Figs. 3 and 5, the opposing portions of belts 66a and 70a have no translational movement relative to each other. Belts 66a and 70a are preferably anchored relative to the ground by an anchor 99 which securely engages both belts at that point so that they undergo no translational movement relative to the ground when the remaining portions 64a and 74a of clamp bars 32 and 34a are moved longitudinally. Alternatively, belts 66a and 70a may be free from the grounds and movable only when engaging a workpiece. However, if the clamp is actuated in its intended manner to engage a workpiece which is fixed relative to the ground, it is preferably to anchor belts 66a and 70a to the ground to avoid damaging a fragile workpiece.

As shown in the sequential operations depicted in Figs. 4 A-E and 5 A-C, the first and second clamp bars 32 and 34 are advanced to engage a workpiece and clamp the workpiece between the opposing contact surfaces of the first and second clamp bars 32 and 34. As such, the first and second contact means sequentially and continuously clamp the workpiece across a section of the workpiece.

According to the present invention, there is provided means for orienting and forcing the first and second clamp means together. It is preferable that the orienting and forcing means is a C-shaped bracket with a portion of the bracket located proximate to the cantilevered end of the second clamp means. it is also preferable that the bracket is secured to the second clamp means and slidable relative to the first clamp means.

As shown and embodied in Figs. 1 and 3, the means for orienting and forcing the first and second clamp means together includes a C-shaped bracket 76 which extends along most of the length of second clamp bar 34. A portion of bracket 76 is located near the cantilevered end of second clamp bar 34. Bracket 76 is secured to remaining portion

74 of second clamp bar 34, and is slidable relative to first clamp bar 32. A low friction strip 78 is positioned between bracket 76 and first clamp bar 32 to facilitate the sliding action between bracket 76 and first clamp bar 32.

In accordance with the present invention, there is provided cutting means mentioned near the cantilevered end of the second clamp means for cutting the workpiece while clamping the workpiece.

As shown and embodied in Figs. 1 and 6, the cutting means includes a razor knife blade 80 which is mounted on and moves with bracket 76 and second clamp bar 34. Blade 80 has a sharp edge 82 for cutting the workpiece as second clamp bar 34 is extended while clamping the workpiece in between first clamp bar 32 and second clamp bar 34. As shown and embodied in Fig. 7, the workpiece is a web 82 which is dispensed from a roll 84 to wrap a load 86 which is conveyed into position on a conveyor 88. As shown in Fig. 7 after the cutting step, web 82 remains clamped in first and second clamp bars 32 and 34 after being cut.

In accordance with the present invention, there is provided wipe down means mounted near the cantilevered end of the second clamp means for wiping down the workpiece while clamping the workpiece. As shown and embodied in Figs. 1, 6 and 7, there is provided a wipedown brush 90 for wiping down the trailing edge portion 92 of the web which has been wrapped around load 86. As a result, trailing edge 92 of the web is smoothed down into an adhered state to a layer of web 94 which has already been wrapped on load 86. The wipedown with brush 90 occurs during the extension of second clamp bar 34 so the clamping, cutting, and wipedown all occurs in one smooth operation.

In accordance with the present invention, there is provided apparatus for clamping a web and wrapping a load with the web comprising: means for dispensing the web; means for rotating the load relative to the dispenser means to wrap the web on the load; and means for clamping the web including a first longitudinally extending clamp means for engaging the web, a second longitudinally extending clamp means extendable in a direction generally parallel to the longitudinal direction of the first clamp means for clamping the web between the second clamp means as the second clamp means is longitudinally extended in a direction parallel to the longitudinal direction of the first clamp means.

As shown and embodied in Fig. 7, there is provided a stretch wrapping apparatus 96 for clamping a web and wrapping a load with the web. The means for dispensing the web includes a web dispenser housing 98 for a rotatably supporting web roll 84 and prestretch rollers 100 and 102. The means for rotating the load relative to the dispenser means to wrap the web on the load includes ring 104 which is rotatably mounted on a frame (not shown) and rotatably driven by a motor 106 in a clockwise direction. Although the web dispenser 98 may be fixed relative to the ground and the load 86 rotated relative to the ground, it is preferable that the load 86 be fixed relative to the ground and that web dispenser 98 move relative to the ground by revolving around the load.

The first and second clamp means may be positioned so that their longitudinal direction is oblique to the plane defined by the path of the revolving dispenser during wrapping. This may be preferable where economy of space is required. As shown in Fig. 8, the longitudinal direction of first and second clamp bars 32 and 34 is oblique to the plane defined by the path of the revolving dispenser which is shown by ring 104 and which as shown generally extends along a horizontal line projected out of the paper.

According to the present invention there is provided means for conveying the load along a direction perpendicular to the plane defined by the path of the revolving dispenser during wrapping. As shown and embodied in Figs. 7 and 8, the means for conveying the load is a conveyor belt 88 which moves in the direction of the arrow shown in Fig. 8 which is perpendicular to the plane defined by the path of the dispenser along ring 104.

The first and second clamp means may be positioned so that their longitudinal direction is oblique to the conveying direction. As shown and embodied in Fig. 8, first and second clamp bars 32 and 34 are positioned oblique to the conveying direction of conveyor belt 88. This allows for a greater economy of space in the conveying direction.

In accordance with the present invention there is provided a method for clamping a web and wrapping a load with a web comprising: positioning a load in a position to be wrapped; rotating the load relative to a web dispenser to wrap the web on the load; extending a first longitudinally extending clamp element along its longitudinal direction into the wrapping path of the web; passing the web over the first clamp element; and subsequent to extending the first clamp element, extending a second longitudinally extending clamp element along its longitudinal direction in a direction parallel to the first clamp element to clamp the web between the first and second clamp elements as the second clamp element is longitudinally extended in a direction parallel to the longitudinal direction of the first clamp element. In accordance with an embodiment of the first invention, it is preferable that the step of extending the first clamp element occurs prior to the step of exending the second clamp element,

and the step of passing the web over the first clamp element occurs subsequent to extending the first clamp element and prior to extending the second clamp element.

As shown and embodied in Figs. 7, 8 and 4 A-E, the load is placed in a position to be wrapped by conveying load 86 on conveyor belt 88 to a position inside and aligned with ring 104. The step of rotating the load relative to a web dispenser to wrap the web on the load is performed by using ring 104 to revolve web dispenser 98 in a circle around load 86. At the beginning of each wrapping operation, the leading edge of web 82 is positioned between clamp bars 32 and 34. It is also possible to start the wrapping cycle by otherwise securing the leading edge of web 82 to the load or the conveyor 88, such as when initiating a continuous operation of wrapping a series of loads.

The step of extending a first longitudinally extending clamp element along its longitudinal direction into the wrapping path of the web is shown as the operation of moving first clamp bar 32 longitudinally between the positions shown in Figs. 4A and 4B. This occurs after the load 86 and conveyor 88 have been wrapped with at least one layer of web 94 shown in Fig. 7.

The step of passing the web over the first clamp element is shown in Fig. 8 by passing the web over first clamp bar 32.

The step of subsequently extending a second longitudinally extending clamp element is shown as the operation of extending second clamp bar 34 from the position shown in Fig. 4B to the position shown in 4C. Bracket 76, being attached to second clamp bar 34, moves with and slides relative to first clamp bar 32. This sequentially and continuously clamps the web across the section of the web between first and second clamp bars 32 and 34.

In accordance with the present invention the step of extending the second clamping element includes cutting the web while clamping the web. It is also preferable that the cutting step includes sequentially and continuously clamping the web ahead of the point at which the web is being cut and that the clamping or the web occurs both in front of and behind the point at which the web is being cut. As shown in Fig. 6, the positioning of razor knife blade 80 on second clamp bar 34 and bracket 76 allows the web to be cut while second clamp bar 34 and bracket 76 are being extended. Since razor knife blade 80 is positioned near but behind the forward edge of second clamp bar 34, the clamping of the web occurs both in front of and behind the point at which the web is being cut. As a result, the web is not pulled out of position during the cutting step and is held in the position shown in Fig. 7 after the cutting step so that a new wrapping operation can proceed.

In accordance with the present invention, it is preferable that the step of extending the second clamp element includes wiping down the trailing end of the web while clamping the web. As shown and embodied in Fig. 7, the trailing end 92 of the web is wiped down with brush 90 while extending second clamp bar 34 to clamp the web.

The step of extending the first and second clamp elements may include extending those elements along the direction which is oblique to the plane defined by the path of the revolving dispenser during wrapping and oblique to the direction in which the load is conveyed. As shown and embodied in Fig. 8, first and second clamping bars 32 and 34 are extended in a direction which is oblique to the path of the dispenser 98 around ring 104 and the direction in which the load is conveyed along conveyor 88.

In accordance with the present invention, it is preferable that in a continuous operation, the wrapped load is removed from the position to be wrapped while continuing to keep the web clamped between the extended first and second clamp elements. As shown and embodied in Figs. 7, wrapped load 86 is conveyed from the wrapping position inside ring 104. A new load to be wrapped, is conveyed on conveyor 88 into a position identical to load 86. Meanwhile, web 82 continues to be clamped between first and second clamp bars 32 and 34 which are extended in the position shown in Fig. 4C.

The step of rotating the new load relative to a web dispenser to wrap the web on the new load is accomplished by revolving film web dispenser 98 around the new load through the use of ring 104.

The second longitudinally extending clamp element is retracted along its longitudinal extent after at least one wrap of web 82 around the load so that web 82 holds against itself and no longer needs to be clamped during wrapping of the new load. This retraction step is shown and embodied as the operation of retracting second clamp bar 34 from the positions shown in Fig. 4C to that shown in Fig. 4D.

The step of retracting the first longitudinally extending clamp element along its longitudinal extent is shown as the operation of retracting first clamp bar 32 from the position shown in Fig. 4D to that shown in Fig. 4E. The load can continue to be wrapped while the first and second clamp elements are retracted as shown and embodied in the position of first and second clamp bars 32 and 34 in the retracted position of Fig. 4E. The whole cycle embodied in the step shown in Figs. 4A-4E may continue to be executed for subsequent new loads, making the operation a continuous one.

In the preferred embodiment of the method described above, the step of retracting the second

clamp element occurs prior to the step of retracting the first clamp element and is shown and embodied in Figs. 4A-4E as independently moving first and second clamp bars 32 and 34 as described.

In accordance with the second preferred method, the steps of extending and retracting the first clamp element and the second clamp element preferably occur simultaneously. As shown and embodied in Figs. 5A-5C, first and second clamp bars 32a and 34a include belts 66a and 70a and first and second clamp bars 32a and 34a extend simultaneously in the operation occurring from Figs. 5A to 5B, and retract simultaneously in the operation from Figs. 5B to 5C.

Claims

1. An apparatus for clamping a web (82) and wrapping a load (86) with the web (82) comprising means (98) for dispensing the web means (104) for rotating the load (86) relative to the dispenser means (98) to wrap the web on the load (86), and a clamp having means for clamping the web (82) including a first longitudinally extending clamp means (32) having first contact means (62;66a) for contacting the web (82) and a second longitudinally extending clamp means (34) having a second contact means (70;70a), both clamping means (32,34) being adapted to clamp said web between the first and second contact means,

   characterised in that said second clamp means (34) is extendible in a direction parallel to the longitudinal direction of the first clamp means (32), said second contact means (70;70a) being supported by a remaining portion (74;74a) of the second clamp means (34) and movable in the longitudinal direction relative to the remaining portion (74;74a) of the second clamp means (34) while being fixed relative to the first contact means (62;66a) as the remaining portion of the second clamp means (34) is longitudinally extended in a direction parallel to the longitudinal direction of the first clamp means (32).

2. The apparatus of claim 1, **characterised in that** the means (104) for rotating the load (86) relative to the dispenser means (98) includes means for revolving the dispenser means (98) around the load (86).

3. The apparatus of claim 1 or 2, **characterised in that** the first and second clamp means (32,34) are positioned so that their longitudinal direction is oblique to the plane defined by the path of the revolving dispenser (98) during wrapping.

4. The apparatus of one of claims 1 to 3, **characterised by** means (88) for conveying the load (86) along a direction perpendicular to the plane defined by the path of the revolving dispenser (98) during wrapping.

5. The apparatus of claim 4, **characterised in that** the longitudinal event of the first and second clamp means (32,34) is positioned oblique to the conveying direction.

6. The apparatus of one of claims 1 to 5, **characterised by** cutting means (80) mounted near the cantilevered end of the second clamp means for cutting the web (82) while clamping the web (82).

7. The apparatus of one of claims 1 to 6, **characterised by** wipe down means (90) mounted near the cantilevered end of the second clamp means (34) for wiping down the web (82) while clamping the web (82).

8. The clamp of one of claims 1 to 7, **characterised in that** the remaining portion (74;74a) of the second clamp means (34) is extendible relative to the first clamp means (32) for clamping the workpiece (82) between the second clamp means (34) and first clamp means (32) when the remaining portion (74;74a) of the second clamp means (34) is extended relative to the first clamp means (32).

9. The clamp of one of claims 1 to 8, **characterised by** a base means (36,38) for supporting and cantilevering the first and second clamp means (32,34).

10. The clamp of one of claims 1 to 9, **characterised in that** the first clamp means (32) has a remaining portion (64a) and the remaining portions (64a,74a) of the first and second clamp means (32,34) are simultaneously extendible relative to the base means (36,38) for clamping the workpiece (82) between the second contact means (70a) and the first contact means (66a) when the remaining portions of the first and second clamp means (32,34) are simultaneously extended in the same direction.

11. The clamp of one of claims 1 to 10, **characterised in that** the first and second contact means (62,70;66a,70a) sequentially clamp the workpiece (82) across a section of the workpiece.

12. The clamp of one of claims 1 to 10, **characterised in that** the first and second contact means (62,70;66a,70a) continuously clamp the workpiece (82) across a section of the workpiece.

13. The clamp of one of claims 1 to 12, **characterised in that** the first and second clamp means (32,34) are slender members.

14. The clamp of one of claims 1 to 13, **characterised by** means (76;76a) for orienting and forcing the first and second clamp means (32,34) together.

15. The clamp of claim 14, **characterised in that** a portion of the orienting and forcing means (76;76a) is located proximate to the cantilever end of the second clamp means (34).

16. The clamp of claim 14 or 15, **characterised in that** the orienting and forcing means (76;76a) is a bracket.

17. The clamp of claim 16, **characterised in that** the bracket (76;76a) is secured to the remaining portion of the second clamp means (34) and slidable relative to the first clamp means (32).

18. The clamp of claim 16 or 17, **characterised in that** the bracket (76;76a) is C-shaped.

19. The clamp of one of claims 1 to 18, **characterised in that** the first contact means (62;66a) includes a resilient material.

20. The clamp of one of claims 1 to 19, **characterised in that** the first contact means (62) is fixed relative to the remaining portion (64;64a) of the first clamp means (32).

21. The clamp of one of claims 1 to 20, **characterised in that** the second contact means (70,70a) is a belt.

22. The clamp of claim 21, **characterised in that** both the first contact means (66a) and the second contact means (70a) are belts.

23. The clamp of claim 22, **characterised in that** each of the belts (66a,70a) is movable relative to the remaining portion (64a,74a) of its respective clamp means (32,34).

24. The clamp of claim 21, **characterised in that** the second contact means belt (70) is secured to the first clamp means (32).

25. The clamp of claim 21, **characterised in that** the second contact means belt (70) doubles back on journals at each end of the second clamp means (34).

26. A method for clamping a web and wrapping a load with a web, comprising the steps of:

positioning a load (86) in a position to be wrapped;

rotating the load (86) relative to a web dispenser (98) to wrap the web on the load, **characterised by**

extending a first longitudinally extending clamp element (32) along its longitudinal direction into the wrapping path of the web (82);

passing the web (82) over the first clamp element (32) and contacting the web with a contact portion (62;66a) of the first clamp element (32); and

extending a second longitudinal extending clamp element (34) along its longitudinal direction in a direction parallel to the first clamp element (32) and contacting the web (82) with a contact portion (70;70a) of the second clamp element (34) while moving the contact portion of the second clamp element (34) in the longitudinal direction relative to a remaining portion (74;74a) of the second clamp element (34) but maintaining the contact portion (70;70a) of the second clamp element (34) fixed relative to contact portion (62;66a) of the first clamp element (32) to clamp the web between the contact portions of the first and second clamp elements (32,34) as the remaining portion of the second clamp element (34) is longitudinally extended in a direction parallel to the longitudinal direction of the first clamp element (32).

27. The method of claim 26 **charactised in that** the step of extending the first clamp element (32) occurs prior to the step of extending the second clamp element (34), and the step of passing the web over the first clamp element (32) occurs subsequent to extending the first clamp element (32) and prior to extending the second element (34).

28. The method of claim 26, **characterised in that** the step of extending the first clamp element (32) and the step of extending the second clamp element (34) occur simultaneously.

29. The method of claim 26, **characterised by**

removing the wrapped load (86) from the position to be wrapped while continuing to keep the web (82) clamped between the extended first and second clamp elements (32,33);

positioning a new load (86) in the position to be wrapped;

rotating the new load relative to a web dispenser (98) to wrap the web (82) on the new load (86);

after at least one wrap, retracting the second longitudinally extending clamp element (34) along its longitudinal direction,

retracting the first longitudinally extending clamp element (32) along its longitudinal direction; and continuing to wrap the web (82) on the load (86) while the first and second clamp elements (32,34) are retracted.

30. The method of claim 29, **characterised in that** the step of retracting the second clamp element (34) occurs prior to the step of retracting the first clamp element (32).

31. The method of claim 30, **characterised in that** the step of retracting the second clamp element (34) and the step of retracting the first clamp element (32) occur simultaneously.

32. The method of claim 27, **characterised in that** the step of extending the second clamp element (34) includes sequentially and/or continuously clamping the web (82) across a section of the web (82).

33. The method of one of claims 26 to 32, **characterised in that** the step of extending the second clamping element (34) includes cutting the web (82) and/or wiping down the trailing edge (92) of the web (82) while clamping the web (82).

34. The method of claim 33, **characterised in that** the cutting step includes sequentially and continuously clamping the web (82) ahead of the point at which the web (82) is being cut.

35. The method of claim 33 or 34, **characterised in that** the clamping of the web (82) occurs both in front of and behind the point at which the web is being cut.

36. The method of one of claims 28 to 37, **characterised by** removing the wrapped load (86) from the wrapping position, placing a new load (86) in the wrapping position, wrapping the web (82) around the new load (86), and retracting the second clamp element (34) from the path of the web.

37. The method of one of claims 26 to 36, **characterised in that** the rotating step includes revolving the web dispenser (98) around the load (86).

38. The method of claim 37, **characterised in that** the step of extending the first and second clamp elements (32,34) includes extending those elements along a direction which is oblique to the plane defined by the path of the revolving dispenser (98) during wrapping and/or oblique to the direction in which the load (86) is conveyed.

39. The method of claim 38, **characterised in that** the step of positioning and removing the load includes conveying the load in a direction perpendicular to the plane defined by the path of the revolving dispenser during wrapping.

Revendications

1. Appareil destiné à maintenir bloquée une bande (82) et à disposer la bande (82) autour l'une charge (86), comprenant des moyens (98) destiné à distribuer le moyen de bande (104) en vue de faire tourner la charge (86) par rapport au moyen de distribution (98) pour enrouler la bande (82) sur la charge (86) et un dispositif de blocage comportant des moyens de blocage de la bande (82), comprenant un premier moyen de blocage (32) s'étendant longitudinalement, doté d'un premier moyen de contact (62 ; 66a) en vue de se mettre en contact avec la bande (82) et un second moyen de blocage (34) s'étendant longitudinalement, dote d'un second moyen de contact (70 : 70a), les deux moyens (32, 34) étant aptes à bloquer ladite bande entre le premier moyen de contact et le second moyen de contact,

caractérisé en ce que ledit second moyen de blocage (34) peut être étendu dans une direction parallèle au sens longitudinal du premier moyen de blocage (32), ledit second moyen de contact (70 ; 70a) étant supporté par une partie restante (74, 74a) du second moyen de blocage (34) et étant susceptible d'être déplacé dans le sens longitudinal par rapport à la partie restante (74, 74a) du second moyen de blocage (34) tout en étant fixe par rapport au premier moyen de contact (62 ; 66a), la partie restante du second moyen de blocage

(34) s'étendant longitudinalement dans une direction parallèle au sens longitudinal du premier moyen de blocage (32).

2. Appareil selon la revendication 1, caractérisé en ce que le moyen (104) destiné à faire tourner la charge (86) par rapport au moyen de distribution (98) comprend des moyens destinés à faire tourner le moyen de distribution (98) autour de la charge (85).

3. Appareil selon la revendication 1 ou 2, caractérisé en ce que le premier moyen le blocage et le second moyen de blocage (32, 34) sont positionnés de façon telle que leur direction longitudinale est oblique par rapport au plan défini par le trajet du distributeur tournant (98) pendant l'enroulement.

4. Appareil selon l'une des revendications 1 à 3, caractérisé en ce qu'il comporte les moyens (88) destinés au transport de la charge (86) dans une direction perpendiculaire au plan défini par le trajet du distributeur tournant (98) pendant l'enroulement.

5. Appareil selon la revendication 4, caractérisé en ce que l'extension longitudinale du premier moyen de blocage et du second moyen de blocage (32, 34) est oblique par rapport à la direction de transport.

6. Appareil selon l'une des revendications 1 à 5, caractérisé en ce qu'il comporte des moyens de coupe (80) montés à proximité de l'extrémité en porte-à-faux du second moyen de blocage et destinés à couper la bande (82) pendant qu'elle est bloquée.

7. Appareil selon l'une des revendications 1 à 6, caractérisé en ce qu'il comporte des moyens (90) de rabattement montés à proximité de l'extrémité en porte-à-faux du second moyen de blocage (34), et destinés à rabattre la bande (82) pendant qu'elle est bloquée.

8. Dispositif de blocage selon l'une des revendications 1 à 7, caractérisé en ce que l'on peut faire dépasser la partie restante (74, 74a) du second moyen de blocage (34) par rapport au premier moyen de blocage (32) en vue de bloquer le morceau utilisé (82) entre le second moyen de blocage (34) et le premier moyen de blocage (32) lorsque la partie restante (74, 74a) du second moyen de blocage (34) dépasse par rapport au premier moyen de blocage (32).

9. Dispositif de blocage selon l'une des revendications 1 à 8, caractérisé en ce qu'il comporte un moyen formant une base (36, 38) destinée à supporter en porte-à-faux le premier moyen de blocage et le second moyen de blocage (32, 34).

10. Dispositif de blocage selon l'une des revendications 1 à 9, caractérisé en ce que le premier moyen de blocage (32) comporte une partie restante (64a) et en ce que l'on peut faire dépasser les parties restantes (64a, 74a) du premier moyen de blocage et du second moyen de blocage (32, 34), simultanément par rapport au moyen de base (36, 38) pour bloquer le morceau utilisé (82) entre le second moyen de contact (70a) et le premier moyen de contact (66a) lorsque l'on fait dépasser simultanément dans la même direction les parties restantes du premier moyen de blocage et du second moyen de blocage (32, 34).

11. Dispositif de blocage selon l'une des revendications 1 à 10, caractérisé en ce que le premier moyen de contact et le second moyen de contact (62, 70 ; 66a, 70a) bloquent successivement le morceau utilisé (82), sur une partie de celui-ci.

12. Dispositif de blocage selon l'une des revendications 1 à 10, caractérisé en ce que le premier moyen de contact et le second moyen de contact (62, 70 ; 66a, 70a) bloquent de façon continue le morceau utilisé (82) sur une partie de celui-ci.

13. Dispositif de blocage selon l'une des revendications 1 à 12, caractérisé en ce que le premier moyen de blocage et le second moyen de blocage (32, 34) sont des éléments minces.

14. Dispositif de blocage selon l'une des revendications 1 à 13, caractérisé en ce qu'il comporte des moyens (76 ; 76a) destinés à orienter et à ressembler de force le premier moyen et le second moyen de blocage (32, 34).

15. Dispositif de blocage selon la revendication 14, caractérisé en ce qu'une partie des moyens d'orientation et de poussée (76 ; 76a) est située à proximité de l'extrémité en porte-à-faux du second moyen de blocage (34).

16. Dispositif de blocage selon la revendication 14 ou 15, caractérisé en ce que le moyen d'orientation et de poussée (76 ; 76a) est un bras.

17. Dispositif de blocage selon la revendication 16,

caractérisé en ce que le bras (76 ; 76a) est fixé à la partie restante du second moyen de blocage (34) et peut coulisser par rapport au premier moyen de blocage (32).

18. Dispositif de blocage selon le revendication 16 ou 17, caractérisé en ce que le bras (76 ; 76a) est en forme de C.

19. Dispositif de blocage selon l'une des revendications 1 à 18, caractérisé en ce que le premier moyen de contact (62 ; 66a) est realisé en un matériau résilient.

20. Dispositif de blocage selon l'une les revendications 1 à 19, caractérisé en ce que le premier moyen de contact (62) est fixe par rapport à la partie restante (64, 64a) du premier moyen de blocage (32).

21. Dispositif de blocage selon l'une des revendications 1 à 20, caractérisé en ce que le second moyen de contact (70, 70a) est une courroie sans fin.

22. Dispositif de blocage selon la revendication 21, caractérisé en ce qu'aussi bien le premier moyen de contact (66a) que le second moyen de contact (70a) sont des courroies sans fin.

23. Dispositif de blocage selon la revendication 22, caractérisé en ce que chacune des courroies (66a, 70a) est susceptible d'être déplacée par rapport à la partie restante (64a, 74a) de son moyen de blocage respectif (32, 34).

24. Dispositif de blocage selon la revendication 21, caractérisé en ce que la courroie (70) constituant le second moyen de contact est fixée au premier moyen de blocage (32).

25. Dispositif de blocage selon le revendication 21, caractérisé en ce que la courroie (70) constituent le second moyen de contact retourne sur des paliers à chaque extrémité du second moyen de blocage (34).

26. Procédé de blocage d'une bande et d'emballage d'une charge au moyen d'une bande, comprenant les opérations suivantes :

mettre une charge (86) en position pour l'emballage,

faire tourner la charge (86) par rapport au dispositif de distribution (98) de bande, en vue d'enrouler le bande sur la charge,

caractérisé en ce qu'il comporte les opérations suivantes :

mettre en position d'extension, un premier élément de blocage (32) s'étendent longitudinalement, dans sa direction longitudinale dans le trajet d'enroulement de la bande (82) ;

faire passer le bande (82) au-dessus du premier élément de blocage (32) et faire entrer en contact avec la bande une partie de contact (62 ; 66a) du premier élément de blocage (32) ;

et la mise en position d'extension dans sa direction longitudinale d'un second élément de blocage (34) s'étendant longitudinalement, dans une direction de blocage parallèle au premier élément de blocage (32) et la mise en contact de la bande (82) avec une partie de contact (70 ; 70a) du second élément de blocage (34) pendant que la partie de contact du second élément de blocage (34) est déplacée dans le sens longitudinal par rapport à une partie restante (74, 74a) du second élément de blocage (34) tout en maintenant la partie de contact du second élément de blocage (34) fixe par rapport à la partie de contact (62 ; 66a) du premier élément de blocage (32) afin de bloquer la bande entre les parties de contact du premier élément de blocage et du second élément de blocage (32, 34) lorsque la partie restante du second élément de blocage (34) est mise en position d'extension longitudinale dans une direction parallèle au sens longitudinal du premier élément de blocage (32).

27. Procédé selon la revendication 26, caractérisé en ce que l'opération de mise en position d'extension du premier élément de blocage (32) s'effectue avant l'opération de mise en position d'extension du second élément de blocage (34) et en ce que l'opération consistant à faire passer la bande au-dessus du premier élément de blocage (32) se produit après la mise en position d'extension du premier élément de blocage (32) et avant la mise en position d'extension du second élément (34).

28. Procédé selon la revendication 26, caractérisé en ce que l'opération de mise en position d'extension du premier élément de blocage (32) et l'opération de mise en position d'extension du second élément de blocage (34) se produisent simultanément.

29. Procédé selon la revendication 26, caractérisé en ce que la charge (86) emballée est retirée dans la position d'emballage, la bande (82) continuant d'être bloquée entre le premier élément de blocage et le second élément de blocage (32, 34) qui sont en position d'extension ;

qu'une nouvelle charge (86) est placée en position d'emballage ;

que l'on fait tourner une nouvelle charge par rapport à un distributeur (98) de bande pour enrouler la bande (82) sur la nouvelle charge (86) ;

qu'après au moins un enroulement, on retire dans son sens longitudinal, le second élément (34) s'étendant longitudinalement ;

que l'on retire dans son sens longitudinal, le premier élément (32) de blocage s'étendant longitudinalement ; et que l'on continue à enrouler la bande (82) sur la charge (86) pendant que le premier élément de blocage et le second élément de blocage (32, 34) sont mis en retrait.

30. Procédé selon la revendication 29, caractérisé en ce que l'opération de retrait du second élément de blocage (34) se produit avant l'opération de retrait du premier élément de blocage (32).

31. Procédé selon la revendication 30, caractérisé en ce que l'opération de retrait du second élément de blocage (34) et l'opération de retrait du premier élément de blocage (32) se produisent simultanément.

32. Procédé selon la revendication 27, caractérisé en ce que l'opération de mise en position d'extension du second élément de blocage (34) comporte le fait de bloquer la bande (82) successivement et/ ou de façon continue sur une partie de la bande (82).

33. Procédé selon l'une des revendications 26 à 32, caractérisé en ce que l'opération de mise en position d'extension du second élément de blocage (34) comporte la coupe de la bande (82) et/ou le rabattement vers le bas du bord (92), qui dépasse de la bande (82) pendant que l'on bloque la bande (82).

34. Procédé selon la revendication 33, caractérisé en ce que l'opération de coupe comporte le blocage successif et continu de la bande (82) en avant de l'emplacement où la bande (82) est en train d'être coupée.

35. Procédé selon la revendication 33 ou 34, caractérisé en ce que le blocage de la bande (82) s'effectue à la fois en avant de l'emplacement où la bande est en train d'être coupée et en arrière de cet emplacement.

36. Procédé selon l'une des revendications 28 à 37, caractérisé en ce que la charge (86) emballée est retirée de la position d'emballage, qu'une nouvelle charge (86) est mise en position d'emballage, que la bande (82) est enroulée autour de la nouvelle charge (86) et que le second élément de blocage (34) est retiré du trajet de la bande.

37. Procédé selon l'une des revendications 26 à 36, caractérisé en ce que l'opération de rotation comprend le fait de faire tourner le distributeur (98) de bande autour de la charge (86).

38. Procédé selon la revendication37, caractérisé en ce que l'opération de mise en position d'extension du premier élément de blocage et du second élément de blocage (32, 34) comporte le fait de mettre en position d'extension ces éléments dans une direction qui est oblique par rapport au plan défini par le trajet du distributeur tournant (98) pendant l'enroulement et/ou oblique par rapport à la direction dans laquelle la charge (86) est transportée.

39. Procédé selon la revendication 38, caractérisé en ce que l'opération de positionnement et d'enlèvement de la charge comprend le transport de la charge dans une direction perpendiculairement au plan défini par le trajet du distributeur tournant pendant l'enroulement.

Patentansprüche

1. Vorrichtung zum Klemmen einer Folie (82) und Umwickeln eines Gutes (86) mit der Folie (82), mit einer Einrichtung zum Ausgeben der Folie, einer Einrichtung (104) zum Drehen des Gutes (86) relativ zu der Ausgabeeinrichtung (98), um die Folie (82) um das Gut (86) zu wickeln, und mit einer Klemme mit einer Einrichtung zum Klemmen der Folie, einschließlich einer ersten sich längs erstreckenden Klemmeinrichtung (32) mit einem ersten Kontaktmittel (62; 66a) zum Berühren der Folie (82) und mit einer zweiten sich längs erstreckenden Klemmeinrichtung (34) mit einem zweiten Kontaktmittel (70; 70a), wobei beide Klemmeinrichtungen (32, 34) so angepaßt sind, daß sie die Folie zwischen dem ersten und dem zweiten Kontaktmittel klemmen können, **dadurch gekennzeichnet,** daß die zweite Klemmeinrichtung (34) in Richtung parallel zur Längsrichtung der ersten Klemmeinrichtung (32) ausfahrbar ist, wobei die zweiten Kontaktmittel (70; 70a) durch einen verbleibenden Abschnitt (74; 74a) der zweiten Klemmeinrichtung (34) gehaltert und in Längsrichtung relativ zu dem verbleibenden Abschnitt (74; 74a) der zweiten Klemmeinrichtung (34) bewegbar sind, während sie relativ

zu den ersten Kontaktmitteln (62; 66a) feststehen, wenn der verbleibende Abschnitt der zweiten Klemmeinrichtung (34) längs einer Richtung ausgefahren wird, die parallel ist zur Längsrichtung der ersten Klemmeinrichtung (32).

2. Vorrichtung nach Anspruch 1, **dadurch gekennzeichnet,** daß die Einrichtung (104) zum Drehen des Gutes (86) relativ zu der Ausgabeeinheit (98) eine Einrichtung zum Drehen der Ausgabeeinrichtung (98) um das Gut (86) aufweist.

3. Vorrichtung nach Anspruch 1 oder 2, **dadurch gekennzeichnet,** daß die erste und zweite Klemmeinrichtung (32, 34) so angeordnet sind, daß ihre Längsrichtung schräg zu der Ebene angeordnet ist, die durch den Weg der sich beim Einwickeln drehenden Ausgabeeinrichtung (98) festgelegt ist.

4. Vorrichtung nach einem der Ansprüche 1 bis 3, **gekennzeichnet durch** eine Einrichtung (88) zum Transportieren des Gutes (86) in einer Richtung senkrecht zu der Ebene, die durch den Weg der sich beim Einwickeln drehenden Ausgabeeinrichtung (98) festgelegt ist.

5. Vorrichtung nach Anspruch 4, **dadurch gekennzeichnet,** daß die Längsausdehnung der ersten und der zweiten Klemmeinrichtung (32, 34) schräg zur Förderrichtung angeordnet ist.

6. Vorrichtung nach einem der Ansprüche 1 bis 5, **gekennzeichnet durch** eine Schneideinrichtung (80), die nahe dem auskragenden Ende der zweiten Klemmeinrichtung (34) zum Schneiden der Folie (82), während diese geklemmt wird, angebracht ist.

7. Vorrichtung nach einem der Ansprüche 1 bis 6, **gekennzeichnet durch** eine Anlegestreicheinrichtung (90), die nahe dem auskragenden Ende der zweiten Klemmeinrichtung (34) zum Inanlagestreichen der Folie (82), während diese geklemmt wird, angebracht ist.

8. Klemme nach einem der Ansprüche 1 bis 7, **dadurch gekennzeichnet,** daß der verbleibende Abschnitt (74; 74a) der zweiten Klemmeinrichtung (34) relativ zur ersten Klemmeinrichtung (32) ausfahrbar ist, um das Werkstück (82) zwischen der zweiten Klemmeinrichtung (34) und der ersten Klemmeinrichtung (32) einzuklemmen, wenn der verbleibende Abschnitt (74; 74a) der zweiten Klemmeinrichtung (34) relativ zur ersten Klemmeinrichtung (32) ausgefahren wird.

9. Klemme nach einem der Ansprüche 1 bis 8, **gekennzeichnet durch** eine Basiseinrichtung (36, 38) zum Haltern und Auskragenlassen der ersten und der zweiten Klemmeinrichtung (32, 34).

10. Klemme nach einem der Ansprüche 1 bis 9, **dadurch gekennzeichnet,** daß die erste Klemmeinrichtung (32) einen verbleibenden Abschnitt (64a) aufweist, und daß die verbleibenden Abschnitte (64a, 74a) der ersten und der zweiten Klemmeinrichtung (32, 34) gleichzeitig relativ zu der Basiseinrichtung (36, 38) ausfahrbar sind, um das Werkstück (82) zwischen dem zweiten Kontaktmittel (70a) und dem ersten Kontaktmittel (66a) einzuklemmen, wenn die verbleibenden Abschnitte der ersten und der zweiten Klemmeinrichtung (32, 34) gleichzeitig in dieselbe Richtung ausgefahren werden.

11. Klemme nach einem der Ansprüche 1 bis 10, **dadurch gekennzeichnet,** daß das erste und zweite Kontaktmittel (62, 70; 66a, 70a) das Werkstück (82) über einen Abschnitt desselben fortlaufend einklemmen.

12. Klemme nach einem der Ansprüche 1 bis 10, **dadurch gekennzeichnet,** daß das erste und zweite Kontaktmittel (62, 70; 66a, 70a) das Werkstück (82) über einen Abschnitt desselben kontinuierlich einklemmen.

13. Klemme nach einem der Ansprüche 1 bis 12, **dadurch gekennzeichnet,** daß die erste und die zweite Klemmeinrichtung (32, 34) schlanke Teile sind.

14. Klemme nach einem der Ansprüche 1 bis 13, **gekennzeichnet durch** eine Einrichtung zum Ausrichten und Zusammendrücken der ersten und zweiten Klemmeinrichtung (32, 34).

15. Klemme nach Anspruch 14, **dadurch gekennzeichnet,** daß ein Teil der Ausrichte- und Zusammendrückeinrichtung (76, 77a) nahe dem auskragenden Ende der zweiten Klemmeinrichtung (34) angeordnet ist.

16. Klemme nach Anspruch 14 oder 15, **dadurch gekennzeichnet,** daß die Ausrichte- und Zusammendrückeinrichtung (76; 76a) eine Klammer ist.

17. Klemme nach Anspruch 16, **dadurch gekennzeichnet,** daß die Klammer (76; 76a) an dem

verbleibenden Abschnitt der zweiten Klemmeinrichtung (34) befestigt und relativ zu der ersten Klemmeinrichtung (32) verschiebbar ist.

18. Klemme nach einem der Ansprüche 16 oder 17, **dadurch gekennzeichnet,** daß die Klammer (76;76a) C-förmig ausgebildet ist.

19. Klemme nach einem der Ansprüche 1 bis 18, **dadurch gekennzeichnet,** daß das erste Kontaktmittel (62; 66a) ein nachgiebiges Material umfaßt.

20. Klemme nach einem der Ansprüche 1 bis 19, **dadurch gekennzeichnet,** daß das erste Kontaktmittel (62) relativ zu dem verbleibenden Abschnitt (64; 64a) der ersten Klemmeinrichtung (32) fest angeordnet ist.

21. Klemme nach einem der Ansprüche 1 bis 20, **dadurch gekennzeichnet,** daß das zweite Kontaktmittel (70, 70a) ein Riemen ist.

22. Klemme nach Anspruch 21, **dadurch gekennzeichnet,** daß sowohl das erste Kontaktmittel (66a) und das zweite Kontaktmittel (70a) Riemen sind.

23. Klemme nach Anspruch 22, **dadurch gekennzeichnet,** daß jeder der Riemen (66a, 70a) relativ zu den verbleibenden Abschnitten (64a, 74a) ihrer jeweiligen Klemmeinrichtungen (32, 34) bewegbar ist.

24. Klemme nach Anspruch 21, **dadurch gekennzeichnet,** daß der Riemen (70) des zweiten Kontaktmittels an der ersten Klemmeinrichtung befestigt ist.

25. Klemme nach Anspruch 21, **dadurch gekennzeichnet,** daß der Riemen (70) des zweiten Kontaktmittels an Lagerzapfen an jedem Ende der zweiten Klemmeinrichtung (34) völlig umgelenkt ist.

26. Verfahren zum Klemmen einer Folie und Einwickeln eines Gutes mit einer Folie mit den folgenden Schritten:
Positionieren des Gutes (86) in einer Stellung, in der es eingewickelt werden soll;
Drehen des Gutes (86) relativ zu einer Folienausgabeeinrichtung (98), um die Folie um das Gut zu wickeln,
gekennzeichnet durch
Ausfahren eines ersten, sich längs erstreckenden Klemmelements (32) in seiner Längsrichtung und in den Wickelweg der Folie (82) hinein;
Führen der Folie (82) über das erste Klemmelement (32) und Berühren der Folie mit einem Kontaktabschnitt (62; 66a) des ersten Klemmelements (32); und
Ausfahren eines zweiten, sich längs erstrekkenden Klemmelements (34) entlang dessen Längsrichtung in einer Richtung parallel zum ersten Klemmelement (32) und Berühren der Folie (82) mit einem Kontaktabschnitt (70; 70a) des zweiten Klemmelements (34), während der Kontaktabschnitt des zweiten Klemmelements (34) in Längsrichtung relativ zu dem verbleibenden Abschnitt (74; 74a) des zweiten Klemmelements (34) bewegt wird, wobei aber der Kontaktabschnitt (70; 70a) des zweiten Klemmelementes (34) bezüglich des Kontaktabschnitts (62; 66a) des ersten Klemmelements (32) festgelegt bleibt, um die Folie zwischen den Kontaktabschnitten des ersten und zweiten Klemmelements (32, 34) einzuklemmen, wenn der verbleibende Abschnitt des zweiten Klemmelementes (34) in Längsrichtung ausgefahren wird, wobei diese Richtung parallel ist zur Längsrichtung des ersten Klemmelements.

27. Verfahren nach Anspruch 26, **dadurch gekennzeichnet,** daß der Schritt des Ausfahrens des ersten Klemmelements (32) vor dem Schritt des Ausfahrens des zweiten Klemmelements (34) erfolgt, und daß der Schritt des Führens der Folie über das erste Klemmelement (32) erfolgt, nachdem das erste Klemmelement (32) ausgefahren ist und bevor das zweite Klemmelement (34) ausgefahren wird.

28. Verfahren nach Anspruch 26, **dadurch gekennzeichnet,** daß der Schritt des Ausfahrens des ersten Klemmelements (32) und der Schritt des Ausfahrens des zweiten Klemmelements (34) gleichzeitig erfolgen.

29. Verfahren nach Anspruch 26, **gekennzeichnet durch** Entfernen des eingewickelten Gutes (86) von der Wickelposition, während man die Folie (82) zwischen den ausgefahrenen ersten und zweiten Klemmelementen (32, 33) geklemmt hält;
Positionieren eines neuen Gutes (86) in der Wickelposition;
Drehen des neuen Gutes relativ zu einer Folienausgabeeinrichtung (68), um die, Folie (82) um das neue Gut (86) zu wickeln;
Zurückziehen des zweiten sich längs erstrekkenden Klemmelements (34) entlang dessen Längsrichtung, nach mindestens einer Wicklung,
Zurückziehen des ersten sich längs erstrek-

kenden Klemmelements (32) entlang dessen Längsrichtung, und Fortsetzen des Wickelns der Folie (62) um das Gut (86), während die ersten und zweiten Klemmelemente (32, 34) zurückgezogen werden.

30. Verfahren nach Anspruch 29, **dadurch gekennzeichnet,** daß der Schritt des Zurückziehens des zweiten Klemmelements (34) vor dem Schritt des Zurückziehens des ersten Klemmelements (32) erfolgt.

31. Verfahren nach Anspruch 30, **dadurch gekennzeichnet,** daß der Schritt des Zurückziehens des zweiten Klemmelements (34) und der Schritt des Zurückziehens des ersten Klemmelements (32) gleichzeitig erfolgen.

32. Verfahren nach Anspruch 27, **dadurch gekennzeichnet,** daß der Schritt des Ausfahrens des zweiten Klemmelements (34) das fortfahrende und/oder kontinuierliche Klemmen der Folie (32) über einen Abschnitt derselben einschließt.

33. Verfahren nach einem der Ansprüche 26 bis 32, **dadurch gekennzeichnet,** daß der Schritt des Ausfahrens des zweiten Klemmelements (34) das Schneiden der Folie (32) und/oder Inanlagestreichen des hinteren Endes (92) der Folie (82) während des Klemmens der Folie (82) einschließt.

34. Verfahren nach Anspruch 33, **dadurch gekennzeichnet,** daß der Schritt des Schneidens das fortlaufende und kontinuierliche Klemmen der Folie (82) vor dem Punkt, an dem die Folie (82) geschnitten wird, einschließt.

35. Verfahren nach Anspruch 33 oder 34, **dadurch gekennzeichnet,** daß das Klemmen der Folie (82) sowohl vor als auch hinter dem Punkt, an dem die Folie geschnitten wird, erfolgt.

36. Verfahren nach einem der Ansprüche 28 bis 37, **gekennzeichnet durch** das Entfernen des eingewickelten Gutes (86) aus der Wickelposition, Anordnen eines neuen Gutes (86) in der Wickelposition, Wickeln der Folie (82) um das neue Gut (86) und Zurückziehen des zweiten Klemmelements (34) aus dem Weg der Folie.

37. Verfahren nach einem der Ansprüche 26 bis 36, **dadurch gekennzeichnet,** daß der Schritt des Drehens das Drehen der Folienausgabeeinrichtung (98) um das Gut (86) umfaßt.

38. Verfahren nach Anspruch 37, **dadurch gekennzeichnet,** daß der Schritt des Ausfahrens des ersten und zweiten Klemmelements (32, 34) das Ausfahren solcher Elemente in einer Richtung umfaßt, die schräg ist zu der Ebene, die durch den Weg der sich während des Einwickelns drehenden Ausgabeeinrichtung (98) festgelegt ist, und/oder schräg zu der Richtung, in welcher das Gut (86) gefördert wird.

39. Verfahren nach Anspruch 38, **dadurch gekennzeichnet,** daß der Schritt des Positionierens und Entfernens des Gutes umfaßt, daß das Gut in einer Richtung senkrecht zu einer Ebene gefördert wird, die durch den Weg der sich während des Einwickelns drehenden Folienausgabeeinrichtung definiert ist.

FIG 1

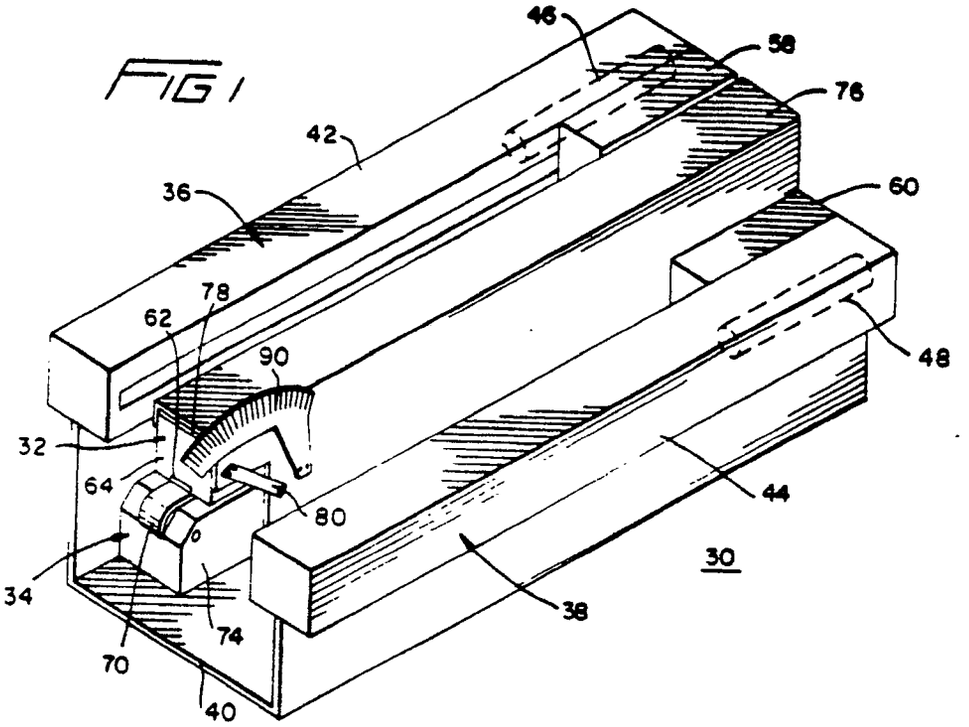


FIG 2

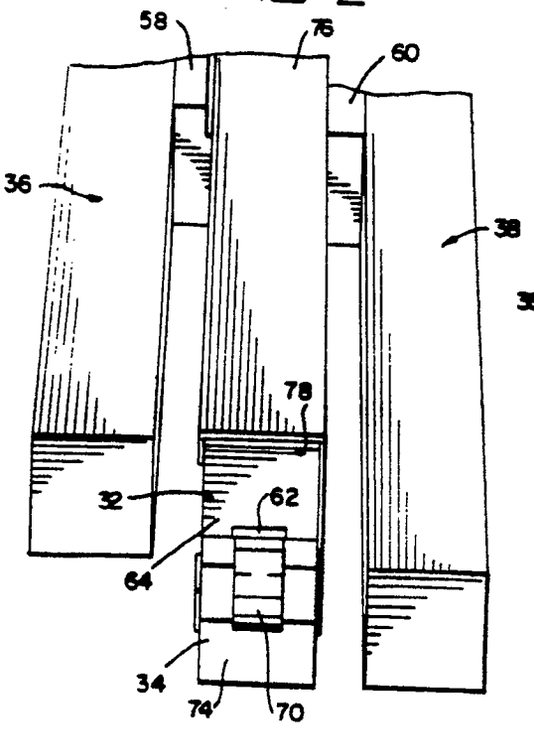
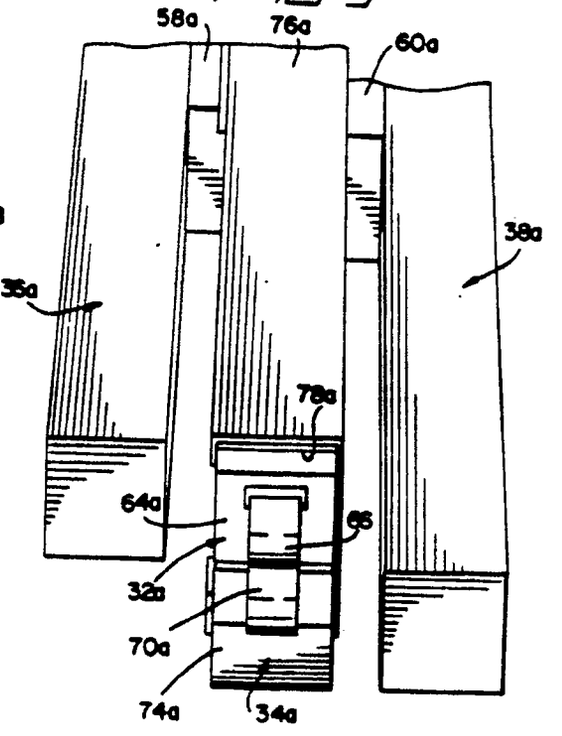


FIG 3



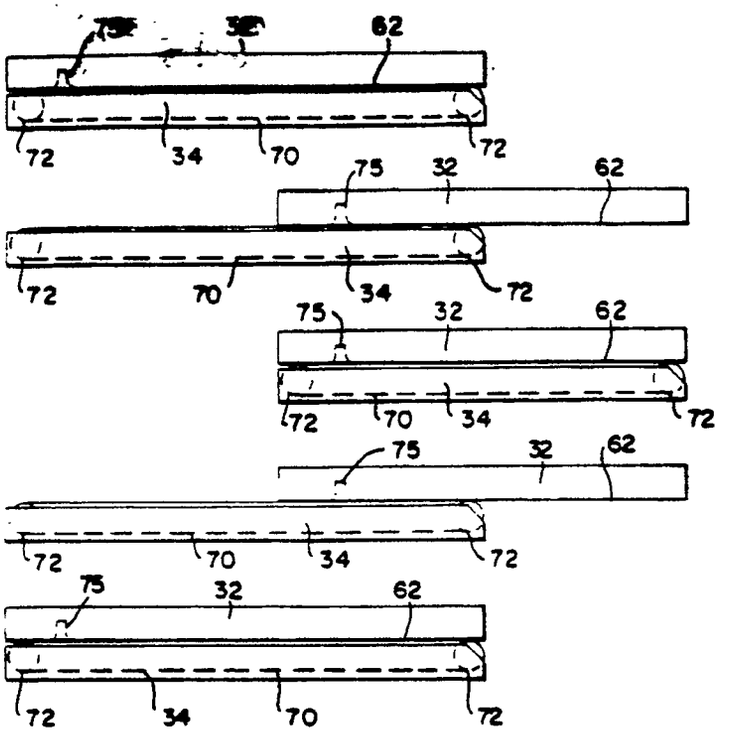


FIG 4A

FIG 4B

FIG 4C

FIG 4D

FIG 4E

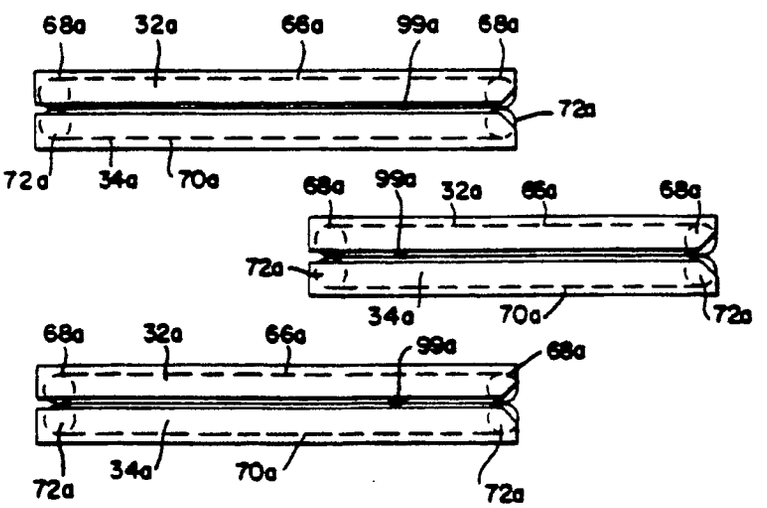


FIG 5A

FIG 5B

FIG 5C

FIG 6

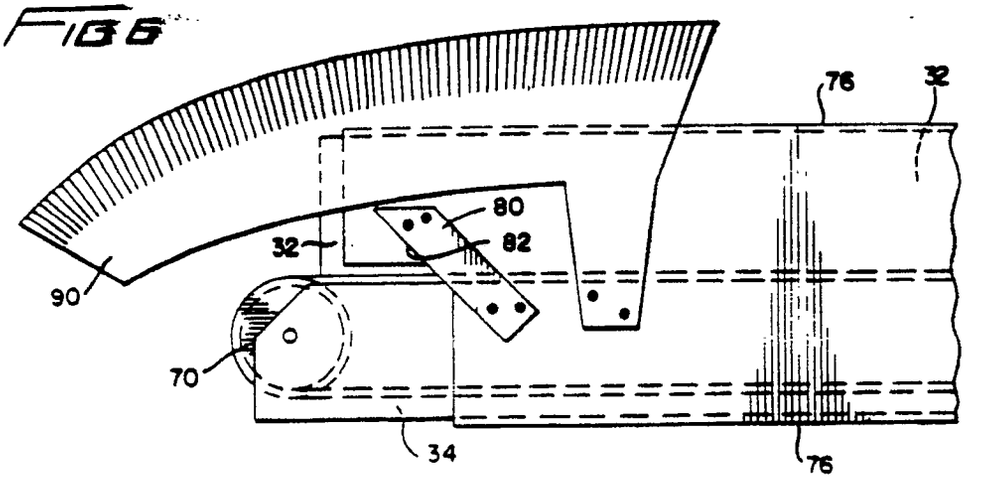
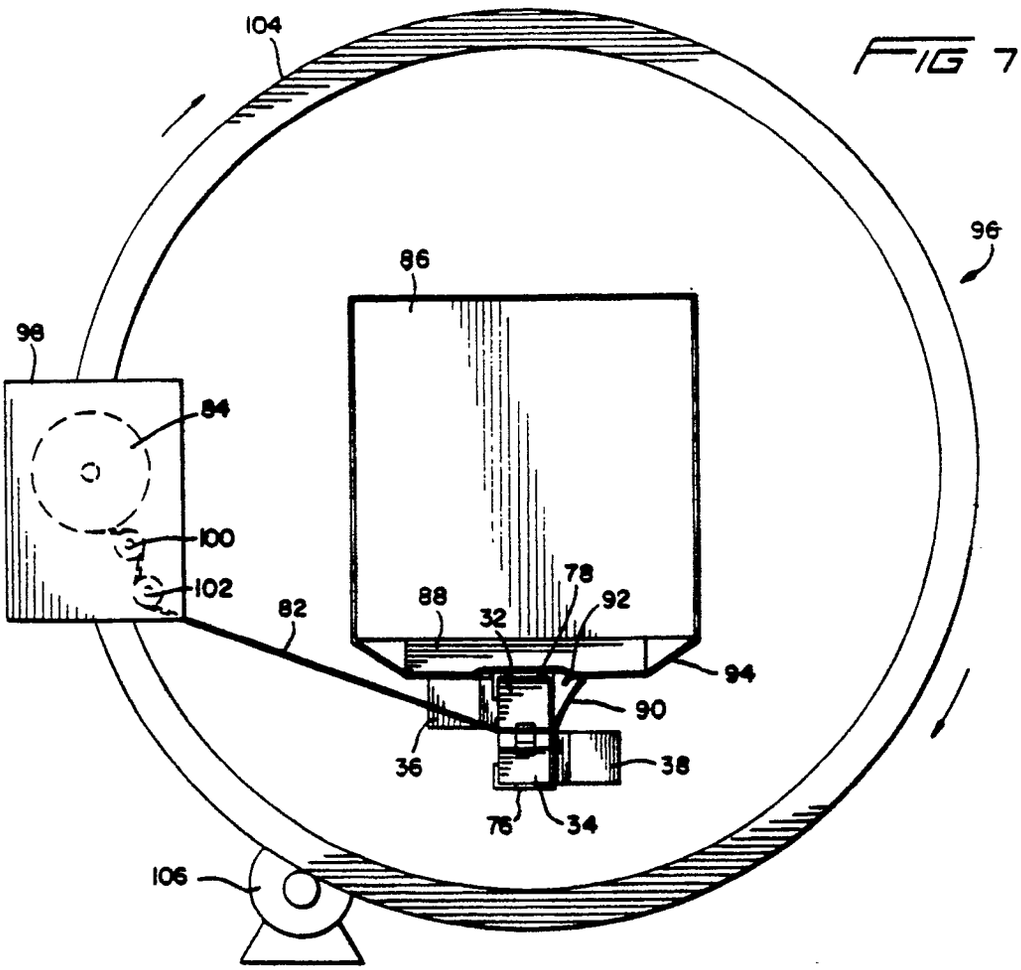

76
32
80
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76

FIG 7


104
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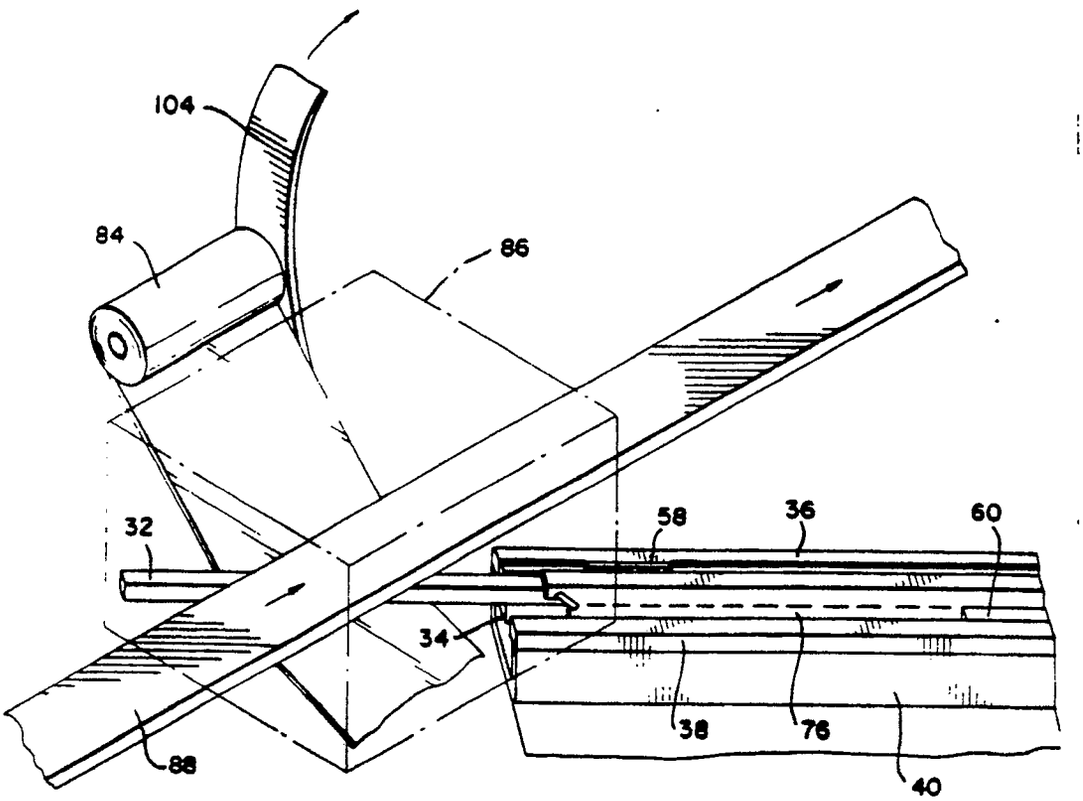


FIG 8